

WHAT IS CLAIMED IS:

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1. A wavelength-division multiplexed optical transmission system for transmitting an optical signal using frames via an optical fiber transmitting line, comprising a device for reducing mutual interference among a plurality of wavelength channels which are transmitted through a same optical fiber transmitting line.

2. A system according to claim 1, further comprising:
a transmitter for converting an inputted electric signal into the optical signal and transmitting the optical signal;
a receiver for receiving said transmitted optical signal.

3. A system according to claim 2, further comprising any one of:

a unit for mutually differing transmitting frame phases between at least two or more wavelength channels among a plurality of wavelength channels which are transmitted through a same optical fiber transmitting line;

a unit for inserting mutually differing dummy data patterns which are different each other among the wavelength channels; and

a unit for scrambling said electric signals with mutually different scrambling patterns.

4. A system according to claim 2, further comprising a frame phase updating unit for mutually differing transmitting frame phases between at least two or more wavelength channels among a plurality of wavelength channels which are transmitted

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5 through a same optical fiber transmitting line.

1 5. A system according to claim 4, further comprising a
2 frame configuration unit for configuring frames of wavelength
3 channels from a signal to be transmitted to said optical fiber
4 transmitting line and selecting an output signal frame phase
5 itself at random.

1 6. A system according to claim 5, wherein said frame
2 phase updating unit comprises:.

3 a phase shifter for shifting a phase by a phase delay
4 quantity which is set on the basis of a reference frame phase
5 that is inputted externally; and

6 a frame phase updating circuit for setting the phase
7 shifted by said phase shifter to an output signal frame phase
8 itself, and wherein

9 said phase shifter presets it to cause said phase delay
10 quantity to mutually differ the transmitting frame phases of
11 a wavelength channel group which is transmitted through said
12 same optical fiber transmitting line.

1 7. A system according to claim 6, further comprising a
2 controller for monitoring and setting the transmitting frame
3 phases of the wavelength channels, wherein

4 said controller sets the frame phase of a device for
5 configuring the frames of said wavelength channels so as to
6 mutually differ the transmitting frame phases among the
7 wavelength channel group which is transmitted through said same
8 optical fiber transmitting line.

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1 8. A system according to claim 7, wherein said
2 wavelength-division multiplexed optical transmission system
3 sets a delay quantity of the transmitting frame phases of the
4 wavelength channels corresponding to the control information .

1 ~~9. A wavelength-division multiplexed optical~~
2 transmission system using a data scrambler based on a pseudo
3 random pattern, comprising a scrambling circuit for mutually
4 differing scrambling patterns between at least two or more
5 wavelength channels among a wavelength channel group which is
6 transmitted through a same optical fiber transmitting line.

1 10. A system according to claim 9, further comprising
2 said scrambling unit for embedding a kind of an applying
3 scrambling pattern to a portion in a transmitting data signal
4 which is not scrambled and transmitting data to a receiving
5 terminal.

1 11. A system according to claim 10, further comprising
2 a scrambling pattern generating unit for communicating a kind
3 of an applying scrambling pattern to a receiving terminal
4 through a control line which is different from a transmitting
5 signal line.

1 12. A system according to claim 11, said scrambling
2 circuit further comprising a unit for enabling transmitters
3 to select one of a plurality of scrambling patterns at random.

1 13. A system according to claim 12, further comprising
2 a controller for monitoring and setting a scrambling pattern

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3 ~~used for the wavelength channels, wherein said controller has~~
4 ~~means for setting the scrambling pattern so as to mutually~~
5 ~~differing the scrambling patterns among a wavelength channel~~
6 ~~group which is transmitted through said same optical fiber~~
7 ~~transmitting line.~~

1 *SUB*
2 *Q1* 14. A wavelength-division multiplexed optical
3 transmission system for transmitting an optical signal via an
4 optical fiber transmitting line, comprising a dummy data
5 generating circuit for mutually differing dummy data patterns
6 between at least two or more wavelength channels among a
7 wavelength channel group which is transmitted through a same
8 optical fiber transmitting line, when said wavelength-division
multiplexed optical transmission system transmits dummy data.

1 15. A system according to claim 14, said dummy data
2 generating circuit further comprising a circuit for using a
3 pattern which is different each other by depending on a
4 transmitter and selected at random as an invalid data pattern.

1 16. A system according to claim 15, said dummy data
2 generating circuit further comprising a circuit for
3 presetting it to mutually differ dummy data patterns by
4 depending on transmitters.

1 17. A system according to claim 16, further comprising
2 a controller for monitoring and setting an invalid data pattern
3 of the wavelength channels, wherein said controller has means
4 for setting a dummy data pattern of transmitters so as to
5 mutually differ the invalid data patterns among the wavelength

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6 channel group which is transmitted through said same optical
7 fiber transmitting line.

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